

WHAT IS CLAIMED IS:

- 1           1.       A method for providing protrusion feedback for a read/write element,  
2   comprising:  
3           writing reference data at a radius on a recording medium using a head;  
4           attempting to read the written reference data;  
5           determining whether the read attempt was successful; and  
6           adjusting a level of heating on a heating element at the head to increase protrusion  
7   of the head until the read attempt is successful.
- 1           2.       The method of claim 1 further comprising recording the level of heating  
2   required to read the reference data successfully.
- 1           3.       The method of claim 2, wherein the recording further comprises recording  
2   the level of heating on a disk.
- 1           4.       The method of claim 2, wherein the attempting to read the reference data  
2   is performed at different drive temperatures.
- 1           5.       The method of claim 4, wherein the recording the level of heating required  
2   to read the reference data successfully further comprises providing the heating levels for  
3   the different temperatures in a look-up table for providing a correct heating level at any  
4   temperature.

1           6.       The method of claim 1, wherein the attempting to read the reference data  
2 is performed at different drive temperatures.

1           7.       The method of claim 1 further comprises determining whether the heating  
2 due to the writing process is too low to provide correct data writing and adjusting the  
3 heating until the writing is determined to be correct.

1           8.       The method of claim 7 further comprises recording the heating level for  
2 obtaining correct data writing.

1           9.       A drive system signal processor, comprising:  
2           a memory for storing data thereon; and  
3           a processor, coupled to the memory, for writing with a head reference data at a  
4 radius on a recording medium, attempting to read the written reference data, determining  
5 whether the read attempt was successful and adjusting a level of heating on a heating  
6 element for the head to increase protrusion of the head until the read attempt is  
7 successful.

1           10.      The drive system signal processor of claim 9, wherein the processor  
2 records the level of heating required to read the reference data successfully.

1           11.      The drive system signal processor of claim 10, wherein the processor  
2 records the level of heating on a disk.

1           12.     The drive system signal processor of claim 10, wherein the processor  
2 performs attempts to read the reference data at different drive temperatures.

1           13.     The drive system signal processor of claim 12, wherein the processor  
2 stores the heating levels for the different temperatures in a look-up table for providing a  
3 correct heating level at any temperature.

1           14.     The drive system signal processor of claim 9, wherein the processor  
2 attempts to read the reference data at different drive temperatures.

1           15.     The drive system signal processor of claim 9, wherein the processor  
2 determines whether the heating due to the writing process is too low to provide correct  
3 data writing and adjusts the heating until the writing is determined to be correct.

1           16.     The drive system signal processor of claim 15, wherein the processor  
2 records the heating level for obtaining correct data writing.

1           17.     A storage device, comprising:  
2           a magnetic recording medium for recording data thereon;  
3           a transducer having an MR element for reading data stored on the magnetic  
4 recording medium and a heating element for increasing protrusion;  
5           a motor, coupled to the magnetic recording medium, for translating the magnetic  
6 recording medium;  
7           an actuator, coupled to the transducer, for translating the transducer relative to the  
8 magnetic recording medium; and  
9           a storage device signal processor, coupled to the motor, transducer and actuator,  
10 for writing with the transducer reference data at a radius on the magnetic recording  
11 medium, attempting to read the written reference data, determining whether the read  
12 attempt was successful and adjusting the level of heating on the heating element to  
13 increase protrusion of the transducer until the read attempt is successful.

1           18.     The storage device of claim 17, wherein the storage device signal  
2 processor records the level of heating required to read the reference data successfully.

1           19.     The storage device of claim 18, wherein the storage device signal  
2 processor records the level of heating on a disk.

1           20.     The storage device of claim 18, wherein the storage device signal  
2 processor performs attempts to read the reference data at different drive temperatures.

1           21.     The storage device of claim 20, wherein the storage device signal  
2 processor stores the heating levels for the different temperatures in a look-up table for  
3 providing a correct heating level at any temperature.

1           22.     The storage device of claim 17, wherein the storage device signal  
2 processor attempts to read the reference data at different drive temperatures.

1           23.     The storage device of claim 17, wherein the storage device signal  
2 processor determines whether the heating due to the writing process is too low to provide  
3 correct data writing and adjusts the heating until the writing is determined to be correct.

1           24.     The storage device of claim 23, wherein the storage device signal  
2 processor records the heating level for obtaining correct data writing.

1           25.     A program storage device readable by a computer, the program storage  
2 device tangibly embodying one or more programs of instructions executable by the  
3 computer to perform a method for providing protrusion feedback for a read/write  
4 element, the method comprising:

5           writing reference data at a radius on a recording medium using a head;

6           attempting to read the written reference data;

7           determining whether the read attempt was successful; and

8           adjusting a level of heating on a heating element for the head to increase  
9 protrusion of the head until the read attempt is successful.

1           26.     A storage device signal processor for detecting contact of a MR sensor  
2     with a recording medium, comprising:  
3           means for storing data; and  
4           means, coupled to the means for storing data, for writing reference data with a  
5     head at a radius on a recording means, attempting to read the written reference data,  
6     determining whether the read attempt was successful and adjusting a level of heating on a  
7     heating element for the head to increase protrusion of the head until the read attempt is  
8     successful.

1           27.     A storage device, comprising:  
2           means for recording data thereon;  
3           means for reading and writing data on the magnetic recording medium, the means  
4     for reading and writing including heating means for increasing protrusion of the means  
5     for reading and writing;  
6           means, coupled to the means for recording data thereon, for translating the means  
7     for recording data thereon;  
8           means, coupled to the means for reading data, for translating the means for  
9     reading data relative to the means for recording data thereon; and  
10          means, coupled to the means for reading data, for writing reference data at a  
11     radius on a recording means, attempting to read the written reference data, determining  
12     whether the read attempt was successful and adjusting a level of heating on a heating  
13     means to increase protrusion of the means for reading and writing until the read attempt  
14     is successful.